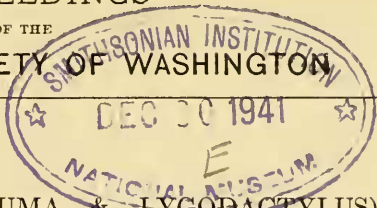


PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW GECKOS (*PHELSUMA* & *LYGODACTYLUS*),
SNAKE (*LEPTOTYPHLOPS*), AND FROG (*PHRYNO-*
BATRACHUS) FROM PEMBA ISLAND, EAST AFRICA.

BY ARTHUR LOVERIDGE.

In their recently published paper on "The Land Vertebrates of Pemba, Zanzibar, and Mafia," Moreau and Pakenham (1940, Proc. Zool. Soc. London, p. 107) invite attention to a suggestion of Parker's that the *Phelsuma* of Pemba Island may be an endemic form of *madagascariensis* Gray, of which other color forms occur on Aldabra and the Seychelle Islands.

With the object of settling the point, Mr. R. H. W. Pakenham collected a series of these geckos, which, under normal conditions, would have been submitted to Mr. H. W. Parker. The latter, however, is serving his country, and so I take pleasure in naming the new insular race after him; paratypes of this and the other races described below, will be reserved for the British Museum.

Undoubtedly Pemba Island has been separated from the mainland sufficiently long to permit of the stabilization of certain color-pattern forms, and I now take the opportunity of stating that *Mabuya maculilabris alboteniata* Boettger, of which Mr. Pakenham has now submitted a good series from various parts of the island, is a perfectly valid race, though I synonymized it in 1928.

***Phelsuma madagascariensis parkeri*, subsp. nov.**

Type.—Museum of Comparative Zoology, No. 46,086, a gravid ♀ from Kinowe, Pemba Island, collected by R. H. W. Pakenham, December 3, 1940.

Paratypes.—Museum of Comparative Zoology, Nos. 46,087-46,092, being four males, a female, and a young gecko, from near Kinazini, Pemba Island, collected by R. H. W. Pakenham, September 9, 1940.

Diagnosis.—Agrees with *madagascariensis* Gray in proportions and scale counts, but differs in color pattern.

Description.—(Paratype variations in parenthesis.) Snout ($1\frac{2}{3}$ to) 2 times as long as the distance between the eye and the ear-opening, vertical diameter of the latter ($\frac{3}{4}$ of, or) equal to, that of the former; rostral without (rarely with) a median cleft above; centre of nostril above the

first labial; nostril between first labial and 3 nasals, the uppermost separated from its fellow by 1 (rarely 2) granule; upper labials 9 (8-10); lower labials 8 (7-9); chin region covered with enlarged scales of which the 4-5 outer pairs are much larger than the inner, the latter posteriorly merging into the gulars.

Back covered with smooth granules; ventral scales smooth; (male paratypes with 32-36 preano-femoral pores); about 16-17 transverse shields and lamellae beneath fourth toe distally; tail, when unregenerate, covered above with smooth scales arranged in verticils of 6-7 scales, below with smooth, imbricate scales, of which the median series is strongly transversely enlarged.

Coloration.—In alcohol. Above, bluish grey (green in life), finely vermiculate with black on back and limbs; tail paler and uniform. Below, whitish, immaculate, even on throat.

Measurements.—Total length of type ♀, 148 (65 + 83) mm., that of a paratype ♂, 148 + (65+ 83+) mm., the tail in process of regeneration.

Breeding.—On December 3, the type ♀ held two ova, each measuring about 13 x 8 mm.

Habitat.—On trunks of coconut palms.

***Lygodactylus grotei pakenhami*, subsp. nov.**

Type.—Museum of Comparative Zoology, No. 46,082, a gravid ♀ from Wete, Pemba Island, collected by R. H. W. Pakenham, December 22, 1940.

Paratypes.—Museum of Comparative Zoology, No. 46,081, a ♀ from Kinazini, and Nos. 46,083-5, being two males and a female from Wete: all taken by the same collector as the type.

Diagnosis.—Agrees with *grotei* Sternfeld in scale counts, but differs in color pattern and habitus, which is smaller and less robust than in *grotei*. The light vertebral and lateral lines of typical *grotei* (of which I recently collected seventeen topotypes) are absent or only faintly indicated. A dark streak from nostril through eye to neck is present, but is both narrower and less well defined than in the typical mainland form. The insular form is characterized by conspicuous black flecking on head, back, and limbs.

Description.—(Paratype variations in parenthesis.) Snout elongate, the distance from its end to the anterior border of the eye much greater than the distance between the orbits anteriorly, much longer than the distance between the eye and the ear-opening, which is small, roundish; nostril pierced above the first labial, so posterior to the suture between rostral and first labial, being between these shields (or the rostral just excluded) and 2-3 nasals, the uppermost separated from its fellow by 1 (or 2) granules; upper labials 8 (or 9); lower labials 7 (or 8); mental deeply fissured, followed by 3 (2-4) small postmentals. Males with 4 preanal pores, fourth toe with 4 pairs of lamellae beneath dilated portion; unregenerate tail below with imbricate scales of which the median series is transversely enlarged.

Coloration.—In alcohol. Above, grey; a narrow dark streak from nostril through eye to above ear-opening, *not* extending to flanks; head and back conspicuously flecked with black, no light vertebral or lateral bands (the

latter slightly indicated in paratype No. 46,081); tail somewhat paler, with darker and lighter mottlings. Below, uniformly white.

Measurements.—Total length of type ♀, 60 (28+32) mm., that of a paratype ♂ (M.C.Z. 46,084), 62 (28 + 34) mm. From snout to anus the other paratypes measure 28, 28 and 26 mm. respectively, their tails being regenerated.

Breeding.—On December 22, the type ♀ held two ova, each measuring about 4.5 x 4 mm.

Habitat.—The Wete series was taken on trees (*Pterocarpus* sp. and *Cassia javanica*) in a garden, also on veranda and walls of house.

Remarks.—These geckos have been compared with sixty typical *grotei* from widely scattered localities in Tanganyika and Mozambique. They constitute the first examples of the genus ever to be recorded from the island, and I take pleasure in associating them with the name of Mr. R. H. W. Pakenham, who has done so much to advance our knowledge of the vertebrate fauna of Pemba and Zanzibar.

Leptotyphlops emini pembae subsp. nov.

Glauconia emini Boettger (not of Boulenger), 1913, in Voeltzkow, Reise in Ostafrika, 3, p. 351, pl. xxxv, fig. 2 (Pemba Island).

Leptotyphlops emini Loveridge (not of Boulenger), 1925, Proc. Zool. Soc. London, p. 72 (Chakechake and Wete, Pemba Island).

Type.—Museum of Comparative Zoology, No. 46,116, a gravid ♀ from Wingwi Pwana, Pemba Island, collected by R. H. W. Pakenham, October 4, 1940.

Paratypes.—Museum of Comparative Zoology, Nos. 46,117–46,121, from Kinazini; Kinowe; and Vitongoje, Pemba Island, collected by R. H. W. Pakenham, v.d., 1940; also No. 19,111, from Chakechake, Pemba Island, taken by Loveridge's native collector, Salimu b. Asmani, October 4, 1923.

Diagnosis.—Differs from the typical mainland form as follows:

Chin, throat, and circum-anal region white flecked with black; midbody diameter (48.3 *vide* Boettger) 50–70 times in total length (10 examples); range: Pemba Island *e. pembae*
 Chin, throat, and circum-anal region black like rest of snake; midbody diameter 40–58.5 times in total length (10 examples); range: East and central African mainland *e. emini*

Measurements.—Total length of type ♀, 201 (184 + 17) mm.; midbody diameter 4 mm. Diameter into length 50.2 times. Total length of a paratype ♂ (M.C.Z. 46,118), 140 (123 + 17) mm.; midbody diameter 2 mm. Diameter into length 70 times.

Remarks.—Boettger (1913), in reporting on the first three worm snakes to be recorded from Pemba, remarked on the white patches of chin and anal regions. Ten years later (1923) my collectors obtained three further examples on the island; these were so stained by rust, from the action of formalin on their container, that I erroneously stated that they were "wholly black." Reexamination of the only specimen retained (M.C.Z.

19,111), however, reveals that it agrees with the six freshly-preserved specimens submitted by Pakenham.

Remeasuring it also discredits the measurement previously given, so that the proportion of diameter into length of 45 times is doubted. I imagine that the diameter of Boettger's 145 mm. specimen is 2.5, rather than 3 mm, which would give 58 (instead of 48.3) times into total length, and conform better to the other data. The total lengths, followed by diameters in parenthesis, are as follows: 121 (2); 135 (3, A.L., doubted); 138 (2); 140 (2.5); 145 (3, O.B., doubted); 148 (2.5); 153 (2.5); 162 (2.5); 163 (3.25, O.B.); 185 (3); 201 (4).

The ten examples of the typical form in the Museum of Comparative Zoology come from localities in Tanganyika Territory; Uganda; Belgian Ruanda; and Belgian Congo.

***Phrynobatrachus pakenhami*, sp. nov.**

Type.—Museum of Comparative Zoology, No. 24,568, a gravid ♀ from Machengwe swamp, near Wete, Pemba Island, collected by R. H. W. Pakenham, April 9, 1940.

Paratypes.—Museum of Comparative Zoology, Nos. 24,569-72, being two adult males and two females with same data as type, except that one was collected May 4, 1940.

Diagnosis.—Agrees with *acridoides* Cope of Zanzibar, Pemba, and tropical Africa, in all respects except its much larger size and different coloring. They may be distinguished as follows:

Lower jaws dusky, *not* sharply chequered with brown and white.

Length of ♂♂ 33-35 mm., of ♀♀ 33-36 mm. *pakenhami*

Lower jaws sharply chequered with brown and white. Length of both ♂♂ and ♀♀ normally 23-25 mm., and exceptional ♀

measures 27 mm. *acridoides*

Description.—In size like *natalensis* Smith, from which it is distinguished by its well-developed digital disks. In other respects it agrees so closely with *acridoides* Cope, of which the Zanzibar cotypes are in the Museum of Comparative Zoology, that further description is unnecessary; perhaps a trifling difference in the amount of webbing might be discerned. The Pemba frog can not be regarded as a race of *acridoides*, however, as the latter species has been collected by Mr. Pakenham at Mkoani, as well as at Verani and Tunda near Wete.

Coloration.—In alcohol. Above, plumbeous or brownish grey, more or less uniform on male with a broad, light, vertebral area; a broad, transverse, interorbital bar present (or absent); hind limbs uniform (or transversely barred with broad, light-edged dark bands). Below, whitish, minutely punctate with brown resulting in areas of infuscation; palms and soles plumbeous.

Measurements.—Length from snout to anus of type ♀, 36 mm., of paratype ♂ (M.C.Z. 24,569), 35 mm.

Breeding.—On April 9, gravid females were taken in water and flooded meadows at edge of swamp; on May 4, a gravid female at edge of thickets on a wooded hillside.